

- 15 -

Claims:-

1. A vortex grit trap comprising a generally vertically extending tank (11) of circular cross-section including a separation zone (12) having an inlet (14) and an outlet (15) for liquid flow to and from the tank, and in which liquid is circulated about a longitudinal axis of the tank, and, a grit collection zone (13) positioned beneath the separation zone (12) in use, the trap being characterised by a generally circular tank divider (18) centred on the vertical longitudinal axis of the tank and extending transverse thereto, the divider defining a notional boundary between the separation and collection zones of the tank and being of smaller diameter than the adjacent region of the tank so as to define with the adjacent tank wall an annulus (23) through which grit passes from the separation zone to the collection zone in use, and, means (18, 22, 25) for generating a cloud of gas bubbles migrating in use upwardly through substantially the whole of said annulus whereby substantially all grit passing from the separation zone into the collection zone passes through the upwardly moving bubble cloud in said annulus so that organic solids settling with the grit are displaced upwardly by the bubbles into the flow within the separation zone while the grit passes through the bubble cloud in the annulus and into the collection zone.
2. A vortex grit trap as claimed in claim 1 characterised in that said gas is air.
3. A vortex grit trap as claimed in claim 1 or claim 2 characterised in that said divider includes an axially extending peripheral skirt (22) extending said annulus into an annular passage (23) in which said bubble cloud is

- 16 -

formed and through which settling grit and rising air bubbles pass in generally opposite directions.

4. A vortex grit trap as claimed in any one of the preceding claims characterised in that said means for generating said upwardly moving bubble cloud in the said annulus rotates about the longitudinal axis of the tank to ensure even distribution of bubbles in the annulus.

5. A vortex grit trap as claimed in any one of the preceding claims characterised in that said divider (18, 118) forms part of said means for generating said bubble cloud, air under pressure being supplied to the interior of said axially extending skirt (22) and passing through circumferentially distributed perforations (25) in said skirt or wall to liberate air bubbles into the liquid in said annulus.

6. A vortex grit trap as claimed in any one of the preceding claims characterised in that said divider (18, 118) rotates about the longitudinal axis of the tank and includes, on its face presented to the separation zone of the tank, impeller means ((19, 119) generating, through rotation of the divider, a rotational flow in the liquid in the separation zone.

7. A vortex grit trap as claimed in any one of the preceding claims characterised in that the separation zone is of significantly larger diameter than the collection zone and the separation zone includes, at its lower-most end, a frusto-conical region (13a) terminating the collection zone (13).

- 17 -

8. A vortex grit trap as claimed in any one of the preceding claims characterised in that the tank wall is defined at least in part by a tank liner.

9. A method of separating grit from an aqueous sewage flow containing, *inter alia*, particulate grit and organic solids, the method comprising, generating and maintaining a rotating flow in a tank to permit gravity separation of the denser particles in the flow towards the axis of rotation, causing the settling particles to pass through an annular gap in a first direction, and, causing a continuous cloud of gas bubbles to pass through said annular gap in an opposite direction, whereby the coaction of the settling particles with the bubble cloud separates lower density organic solids from the settling particles and returns them to the rotating flow allowing the more dense grit particles to collect for removal.